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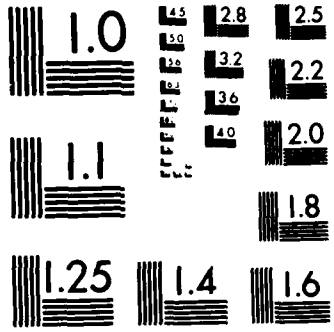

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ANALYZING ALTERNATIVE CONCEPTS FOR THE DEFENSE OF NATO

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INTRODUCTION

The objective of this paper is to provide a perspective on several aspects of the analysis of alternative defense concepts for NATO. Rather than treating the subject in a broad and general way, the paper uses three specific concepts for the conventional defense of the Central Region as examples.

The descriptions of the three concepts and some of their military, economic, and political dimensions should raise a host of questions. These can serve to illustrate some of the different factors to be considered in the quantitative analysis of NATO defense concepts.

BACKGROUND

Virtually from its birth over 35 years ago, the North Atlantic Treaty Organization has been faced with crises or controversies. It has had to deal with issues connected with events as diverse as the Berlin Blockade, the invasion of South Korea, the Soviet acquisition of a thermonuclear capability, the formation of the Warsaw Pact, the war(s) in the Middle East, the Hungarian revolution, the proposed creation of a multilateral nuclear force, the French "withdrawal," the invasion of Czechoslovakia, the SALT and MBFR negotiations, the growth of Soviet military strength, the possible deployment of neutron weapons, the invasion of Afghanistan, the deployment of an intermediate range nuclear force (INF), and dozens of other major and minor military, political, and economic issues.

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Despite this host of external and internal problems, the Alliance has remained remarkably stable in its membership, basic charter, and cohesiveness. Fundamentally, the military focus of the NATO nations has always been on the deterrence of conflict. That focus will continue to be the major thrust, but there are widespread and growing views that the approaches and mechanisms of the past may not be adequate for the future. To some people the decade ahead will present unprecedented challenges which they perceive as resulting from the growth of military power in both the East and West, the potential for massive defense expenditures, the multi-polarity of international relations, the shrinking pools of military manpower, the impact of anti-nuclear movements, and a variety of other factors.

Although there is concern about NATO's future in the face of these challenges, the remedies suggested for dealing with the future differ considerably. One set of views holds that, despite the history of crises and controversies, NATO survives and adapts because it is a "transatlantic-bargain" and because there is a consensus in the Alliance that there has to be such an Alliance. Thus, even though the members may face difficult individual and collective economic, political, and defense problems, there is no alternative to a commitment to a common defense. Therefore, the remedy for the future is the passage of time and the good offices of the members of the Alliance.

A second set of views considers the current period as propitious for major changes in either the form of the U.S. commitment to European security, i.e., the NATO alliance, or to the commitment itself. For this group, today's conditions are not the same as those that led to the formation of the Alliance in terms of risk, cost, or implications. Therefore, some sweeping changes should be considered. The remedies suggested by proponents of this view include such major changes as unilateral U.S. withdrawal or the establishment of an entirely new Alliance structure. In most cases, the proponents deal with possible directions or alternatives to the North Atlantic Treaty Organization in the long term--ten to 20 years in the future, the emphasis is on the policy aspects of these remedies more than on the military implications.

By contrast to the remedies suggested by these two groups, proponents of other types of remedies concentrate on the "military" nature of the Alliance. They emphasize ways to enhance NATO's defense capabilities. This type can also be divided somewhat arbitrarily into two groups; one includes those with the views that NATO is facing a growing threat in an era in which the United States no longer has the edge in strategic military capabilities. By and large, this group espouses NATO's current strategic concept, but its advocates seek remedies of "more" or "better" capabilities to implement the concept. These include such remedies as a long-term defense program (LTDP), deployment of intermediate-range nuclear forces (INF), enhanced defense capabilities through the use of emergency technologies (ER), etc.

The other group also considers the growth in Soviet power a crucial element in the developing crisis of the 1980s. However, the advocates in this group stress the fact that the desired improvements in NATO's military capabilities require basic changes in NATO's defense concepts and military posture. Although the various proponents of this group endorse MC 14/3 to different degrees, they are uniform in their view that enhancing NATO defense should not be restricted to improvements in current capabilities. They advocate new defense concepts and postures. The changes vary considerably and include such forms as the use of fortified zones or barriers, infantry-heavy area defense units, and various air/land battle concepts.

Even though the four groups espouse different ways of remedying the perceived situation in NATO, they generally agree on several broad issues. These include the desirability, if not the requirement, for improvements in U.S. strategic nuclear capabilities, although there are individual differences as to the type and magnitude of such improvements. And proponents in all groups generally encourage the continual exploration and expansion of arms control measures with the Soviet Union.

In terms of the different groups, the work described in this paper is most relevant to the remedies considered under the fourth group, i.e., alternatives to NATO's current defense concept. An early

phase of the work reviewed several classified and unclassified publications that proposed new concepts for the defense of NATO. Summaries of some of the unclassified concepts are published in R. Levine et al, "A Survey of NATO Defense Concepts," The Rand Corporation, N-1871-AF, June 1982. For most of the concepts described in the survey, the individual authors identified the reasons why they believed a change in NATO defense capabilities was required and why the particular change or new concept that was proposed had merit. But few of the authors included or had the resources to undertake even moderately detailed quantitative analyses of their proposals. Without some quantitative analysis, it is difficult to obtain an overall perspective on the proposals in terms of their relative contributions to Alliance defense effectiveness, the magnitude of the investments in resources required, or the variety of military, political, social, or technical issues that they raise.

In undertaking the work described in this paper, we made the conscious decision to favor breadth rather than depth in our approach. Nevertheless, emphasis was on making the work as quantitative as possible commensurate with the level of effort available. The next section describes the methodological approach.

THE METHODOLOGICAL APPROACH

The methodological approach to the study consisted of three parts: the overall research strategy, the techniques or models used for the study, and the development of results and conclusions. For this study, the research strategy was straightforward and comprised:

- o developing a general assessment of NATO's current conventional defense capability.
- o defining three broadly different types of conventional defense alternatives for NATO.
- o determining the requirements that the defense alternatives would have to meet in order to achieve a stated objective.

The stated objective for each of the three alternative concepts was to provide NATO with an effective forward defense. For purposes of this study, an effective forward defense was defined as limiting the Warsaw Pact ground penetration to not more than 50 kilometers into the Federal Republic of Germany. This simple and somewhat arbitrary measure of effectiveness (MOE) was based on the view that NATO endorses a "forward defense" concept and that NATO's wartime posture, although heavily conditioned by terrain and area, in broad terms consists of a covering force area (CFA) extending about 20 to 30 kilometers inside the interzonal border, and a main defense area extending to a depth of about 50 kilometers. Therefore, the halting of Warsaw Pact penetrations within 50 kilometers of the border can be regarded as preventing the Pact from breaking through NATO's main defense area. It should be clearly understood that in using this analytically convenient measure, no implication of the political or operational adequacy of the measure is intended.

The primary tool for analyzing NATO's current conventional defense capability, as well as for analyzing the requirements of the three alternative defense concepts to meet the stated MOE, was a highly aggregated computer model. Since the study was focused on the Central Region and was examining very different defense concepts under a variety of conditions, the theater model was designed to deal with broad concepts like "Mass," i.e., different numbers of NATO and Pact forces with varied capabilities; "Space," i.e., different defense postures and different axes of attack and defense in the different NATO corps areas, as well as different parameters for advancing or withdrawing in FRG territory; and "Time," i.e., different periods of mobilization for the NATO and Pact forces, as well as different periods of combat activity. As a result of this level of aggregation, the model was titled the Mass And Space/Time Evaluation Routine, or MASTER.

MASTER is a theater level, expected value, piston-type, force ratio model. It represents primarily the geographical area of the Federal Republic of Germany divided into 40 regions consisting of eight Corps areas, each of which has five zones. The model incorporates:

- o Terrain (four different types)
- o Forces (brigade/regiment level for NATO; division level for the Pact ground forces. Air forces are represented in terms of 10 to 15 different types of aircraft)
- o Timing (six-hour cycles of combat for up to 60 days of war)
- o Reinforcements (daily arrivals in the combat area for both NATO and Pact air and ground forces)
- o Attrition (modified Lanchester representation)
- o Movement (rates of advance for different force ratio, terrain, and posture conditions)
- o Posture (di ferent defense postures depending on geographical area, force ratio, etc.)

The model was based on several more detailed theater-level simulations, but it did not incorporate many factors such as weather, logistics, command-control-communications activities, etc. The model outputs included daily and summary information on FEBA/FLOT location, force ratios, sorties, air and ground casualties, etc.

Using MASTER, a series of simulation runs were made to provide a broad assessment of NATO's current capability to conduct a successful "forward defense." As anyone familiar with combat simulations is aware, there are innumerable factors, conditions, and scenarios that can be varied in most theater level models. As a result, any identification of a "base case" is arbitrary and can be considered a device that serves more as an analytic convenience than as a representation of basic capabilities. Thus, while our work did use a base case, it was only as a device for establishing conditions to be used in the assessment of the alternative defense concept. The base case was derived from a series of model runs in which a large number of factors were varied. Among these were different types of ground force ratios, different mobilization periods for both sides, different air and ground force employment strategies, different rules as to when the sides would attack, withdraw, or hold, as well as different values for the attrition and movement variables, etc.

Without going into all the details or trying to identify sets of specific outcomes and the relevant conditions associated with these outcomes, the general results of our assessment of NATO's current defense capability were in line with the results of many theater level studies. In effect, NATO forces under the majority of conditions and factors examined were unable to prevent the Pact from penetrations well into and, in many cases, through NATO main defense areas. It was the cases in which the Pact penetrated beyond the (arbitrary) 50 kilometer depth that were used as the standard base for the assessments of the alternative defense concepts.

It is possible to identify at least three very general approaches to the military defense of NATO's Central Region in the event that the Warsaw Pact is not deterred from aggressive action. One approach is literally to prevent the Pact from any significant penetration of the Federal Republic of Germany. A second approach is to allow the initial Pact attack forces to cross the interzonal border but to prevent them from being reinforced by any follow-on forces. A third approach is to allow Pact forces to cross the border, to penetrate in force, but to reduce their capability by maneuver and/or attrition so that they lose the ability to continue their advance before the Federal Republic is overrun.

On the basis of these three broad approaches, we developed a different defense concept for each approach. As an example of the approach that stops Pact forces at the border, we configured a Barrier concept. As an example of preventing the follow-on or second echelon forces from penetrating the Federal Republic, we configured a concept called Forward Response that incorporated an "interdiction belt." As an example of gradually attriting Pact forces as they penetrate, we configured a concept of Distributed Area Defense that utilized small anti-tank units operating throughout the first 50 to 100 kilometers inside the border. The following sections describe each of the concepts briefly and present some comments on various aspects of the assessments carried out in the study.

FORTIFIED BARRIER

The use of barriers or fortifications constructed during peacetime for enhancing NATO's defense capability is not new. Over the years, a large number of proposals or studies for various types of barriers have been made in various countries by various people or organizations. In many cases, the work was little more than an appeal for considering the peacetime construction of barriers as an increment to NATO's defense posture. In other cases, the studies were much more detailed. A partial list of some of the studies that have presented design and analytic data includes:

1956	Land Defense of NATO Europe in the Period 1958-1960
1962	Effect of Fortified Barrier Systems on Force Requirements in Central Europe
1963	An Illustrative Area Defense Ground Posture for NATO's Central Front
1964	USAREUR Optimum Barrier Study
1977	Prewar Terrain Sculpturing Concept, Alternative Operations Concepts in Europe (AOCEUR)
1977	Strengthening NATO Capabilities: A Hi-Lo-Ground Force Mix for Area Defense
1979	Heavy/Light Forces Study
1980	Tactical Nuclear Technology in the NATO Context (Project DYNAMIGHT, Phase II)
1982	Peacetime Defense Preparation in Europe
1983	A Fortified Barrier Option for the Defense of NATO

A review of the available studies indicates that virtually without exception they conclude that a barrier would enhance NATO's defense capability. However, there is considerable variation in the studies about the form of the barrier and in its effectiveness. The main elements illuminated by the past studies appear to be:

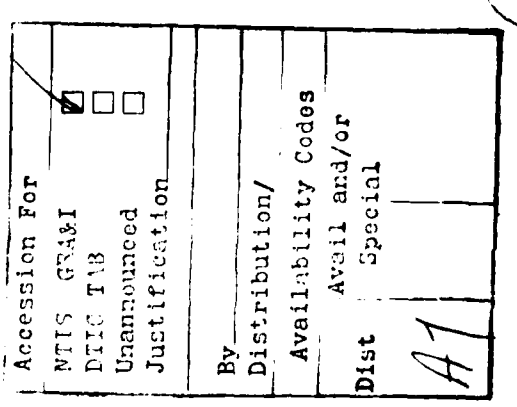
- Barriers require widths generally measured in tens of kilometers. A single narrow fortified defense line is

likely to be inadequate, particularly against modern weapons.

- o Barriers generally must be supported by backup forces to counter enemy penetrations. The backup forces (or firepower) require considerable mobility to move to areas where they are needed.
- o Barriers composed of individual positions or strongpoints are likely to be more vulnerable to penetration than those composed of continuous interlocking positions.
- o Barriers tend to limit the contribution of those defense forces at the portions of the barrier that are not under enemy attack. These forces do not contribute directly to attrition of enemy forces nor do they represent an offense threat that requires the enemy to maintain holding forces in areas where he is not attacking.
- o If a barrier of strongpoints, forts, or fortified positions is breached, some of the defense forces in these positions are likely to be bypassed and unable to contribute to subsequent military operations.
- o Improvements in military technology, particularly in sensors, precision weapons, etc., lower manpower requirements.

These conclusions, plus lessons derived from a number of historical examples, led to the outline of the barrier concept. However, to meet the stringent criteria of stopping Pact penetrations withinin 50 kilometers of the border, the resultant barrier took on the character of a "modern" Maginot line, i.e., heavy interconnected fortifications in depth with major weapon systems throughout the length of the zone.

The main characteristics of the fortified barrier were:



- o Length
  - Approx. 800 km
- o Width
  - Approx. 20 km
- o Construction
  - Multiple zones of defenses
  - Reinforced concrete/steel
  - Major underground facilities
  - Chemical, fallout safe
  - Interconnected sections
- o Technology
  - Advanced precision fire weapons, rockets
  - Advanced surveillance, sensor, AWX systems
  - Robotic control, computer assessments
  - Remote control
- o Manning
  - Specialized force
  - Reduced troop level for area defended
- o Major support and reserve forces
  - Other NATO forces

Obviously, the characteristics of the barrier could be greatly simplified if the criterion for defense effectiveness were changed. A barrier that simply delays a Pact attack for a short period of time or a barrier that increases the attrition to Pact forces (or decreases attrition to NATO forces) by some small amount, need not have the extensive, massive character of the one configured here.

Using the MASTER model, a variety of delay times and attrition conditions were investigated. Without going into the details, the results were what might be expected. In general, they indicated that the longer the barrier could hold out, the lower the rate of attrition it had to inflict on the enemy before he was reduced to a point where he could not achieve a deep penetration into NATO territory. However, if the enemy committed a large force to the attack, a barrier that could hold out and also inflict heavy losses on the enemy (with limited losses of the defense force) tended to require the kind of continuous, massive, integrated fortifications and firepower capability of the type configured in the modern Maginot line.

However, it is generally accepted that almost any type of barrier will contribute something to the military effectiveness of NATO. It has generally been non-military considerations, i.e., cost and political issues that have been crucial to the peacetime construction of a barrier. As far as cost is concerned, it depends on the type and extent of the barrier. Limited barriers in selected areas of possible Pact attack could cost in the millions to tens of millions of dollars, while elaborate and extensive fortified barriers of the type described here could run into the tens of billions of dollars. Add to this the potential costs of obtaining land in the border area, as well as some evacuation and relocation of people and business activities from the border to other areas, and the costs could be closer to a hundred billion dollar amount.

The view that not only are such costs unacceptable but that the dislocation of people and businesses in the border area cannot be seriously considered are among the reasons that barriers have never received serious consideration despite their military contribution. In addition, a host of other reasons have been advanced. Although it is outside the scope of this paper to enumerate or examine in detail all the complex political, social, economic, and broad military rationales that have been advanced for not pursuing barrier development, a few of the more common ones can be synopsized as follows:

- o The dangers of defense mindedness. This somewhat vague notion incorporates such diverse views as "only the offense can win wars;" static, linear defenses can be defeated; reliance on fixed defenses can lead to a loss of national willingness to fight. Many of these views grew out of the experience in World Wars I and II, particularly the alleged French dependence on the Maginot line.
- o The "legitimization" of a divided Germany. According to this notion, a barrier, particularly one along the border between West and East Germany, would imply NATO acceptance of the permanent division of Germany. Such an acceptance is regarded by some as disastrous for West Germans; it is

also considered a severe blow to those East Germans who hope that someday the two Germanys will be reunified. To deny this possibility of reunification is assumed to constitute a political concession that no FRG government could make and still remain in power.

- o The "reduction" in the commitments of the NATO nations. A barrier that greatly increased the FRG's ability to defend itself would assumably allow other nations, particularly the United States, to reduce forces in the theater. Although ground forces would be the most likely candidates, the reduction could also extend to air forces and eventually to a lessening in the political commitment of the United States and other NATO nations to defend FRG territory.
- o The raising of the escalation threshold. This view holds that a greatly increased capability for conventional defense of the FRG would force the Warsaw Pact to emphasize the use of nuclear weapons for offensive operations against NATO. Conversely, if barriers are not effective against a Warsaw Pact attack, NATO would be assumed to have lost flexibility in its current conventional defense and would be forced to escalate.

In summary, this section has tried to illustrate one example of one approach to different defense concepts for NATO and their implications for analytic work. The approach has been to consider ways of preventing Pact forces from penetrating very far into the Federal Republic of Germany in a conventional conflict. The one example has been the use of a barrier. The analytic effort indicated that a criterion measure like stopping the Pact in the border area could lead to requirements for a massive and extensive fortified barrier. And, finally, that establishing the military utility of such a barrier was only one aspect of the issues involved in an analysis of alternative NATO defense concepts.

FORWARD RESPONSE

The second broad approach to NATO defense is to consider concepts that would prevent the Pact from following up an initial attack by committing their second echlon or follow-on forces. Most of the concepts for this defense option involve some form of interdiction effort and are proposed in a variety of forms such as "interdiction of the second echelon," "follow-on forces attack," "deep battle," etc. The essence of these concepts is to locate and attack Pact forces before they can enter battle. Although all the concepts involve surveillance, target acquisition, and attack activities, they may differ in when, where, and how these activities may be carried out. In general, emphasis is placed on the value of advanced or emerging technologies for contributing to the interdiction efforts.

Another example of a concept for preventing follow-on Pact forces from entering the battle is a concept that has been called "forward response." The forward response concept envisions a two-phase operation that would be initiated as soon as possible after Pact forces had crossed the interzonal border in force. The concept involves an early, coordinated effort to create an "interdiction belt" on the eastern side of the border.

Phase One would consist of attacks on fixed lines of communication (LOCs) in a pre-designated zone along the border with the immediate objective of disrupting the enemy's scheme of maneuver.

Phase Two would consist of the attack on Pact forces attempting to transit the interdiction belt. The objective of these continuing attacks would be to prevent the Pact from introducing sufficient force into the Federal Republic so that it could continue its advance beyond 50 kilometers.

The interdiction belt is envisioned as a zone 20 to 30 kilometers wide extending approximately 800 kilometers along the eastern side of the interzonal border. One illustrative location of the belt would be about five to 10 kilometers inside the German Democratic Republic and Czechoslovakia.

The concept of an interdiction belt as considered here differs from many of the more traditional views of interdiction operations. In these views, interdiction involves attacks along the enemy's LOCs extending from the combat area back through into the enemy's rear areas, basically in the east-west direction. By contrast, the interdiction belt described here would be across the enemy's LOCs, basically in the north-south direction. In the traditional views, the targets are either "choke points" along the enemy's LOCs to slow movement of forces or enemy units moving along the LOCs. In the interdiction belt, the targets are first the choke points that would impede the movement of enemy forces across the belt, and then the units attempting to go through the area. In the traditional view, interdiction operations may extend hundreds of kilometers behind the combat zone. They may involve going deep into the German Democratic Republic and Czechoslovakia and involve locating and attacking targets somewhere in areas of hundreds of thousands of square kilometers. By contrast, the interdiction belt focuses operations in a narrow geographical area of about 24,000 square kilometers, i.e., 30 by 800 kilometers just east of the FRG border.

The interdiction belt concept raises a large number of questions, only some of which are subject to quantitative analysis. A few of these are illustrated here.

How large an effort is required to carry out Phase One of the concept?

Since Phase One emphasizes attacks on fixed LOC targets as a first step in disrupting the enemy's ability to follow up his initial attack, a map analysis of the border area can provide an initial basis for determining likely axes of enemy attack, numbers of LOCs, available targets on the LOCs, and similar data.

Using as the exemplar a 30 by 800 kilometer belt located about five kilometers inside the border, a map analysis indicated that there are hundreds, but not thousands, of roads (and railroads) that, if cut, would prevent any crossing of the belt on a paved surface. Further analysis indicated that on each of these hundreds of routes, one or

more potential targets such as bridges, slide areas, choke points, etc., could be identified. If destroyed, enemy movement across the belt would be impeded while he repaired the damage and/or tried to develop alternate routes.

Thus, even if there were literally no information or intelligence on where the Pact might cross the interzonal border, the destruction of these hundreds of targets would contribute to disrupting the enemy's initial attack plans. To the extent that pre-attack intelligence provided information on the routes that the enemy was using in the border area, this number could be substantially reduced. For example, if the enemy were moving along eight axes and using three or four routes through the belt on each axis of advance, the initial number of targets would not require a major air interdiction effort.

How large an effort is required to carry out Phase Two of the concept?

To provide some analytic insights into this question, the MASTER model was run under conditions that simulated a number of Pact attacks after different periods of mobilization, with different attack plans involving different numbers of attack axes. Without going into all the details, two of the general conclusions of the simulation should be noted. First, there was no need to try to stop all the enemy forces from successfully crossing the belt. Over a wide range of simulations, the ability to prevent only about one-third of the enemy's fighting vehicles (tanks, armored carriers, artillery, etc.) from crossing the belt was sufficient to reduce the enemy's strength arriving in the FRG to the point where he did not have an adequate force strength to penetrate beyond 50 kilometers of the border against NATO defense forces. In effect, the "leakage" through the belt could be a substantial 60 to 70 percent of the enemy's forces and it would be effective.

The second conclusion, related to the first, was that the effort required by NATO, and particularly by NATO tactical air units, varied enormously depending on the size, timing, and location of the Pact attack. If the Pact initiated the attack with limited forces and the

follow-on forces arrived slowly and in small numbers, NATO tactical air could generate sufficient capability to provide the desired attrition level. However, as the size, timing, and location of the Pact attack placed greater demands on NATO tactical air, it reached the point where it was not possible to inflict the necessary loss level on the Pact forces. Under these circumstances, the interdiction belt concept would be ineffective with NATO's current capabilities. However, a series of feasible improvements in NATO capabilities were postulated. These constituted changes in types of weapons systems, weapons effectiveness, all-weather capabilities, aircraft sortie rates, etc., available to NATO. Under these conditions, the interdiction belt concept appeared feasible even against a very heavy Pact attack. But these capabilities could only be introduced into NATO's defense forces over a period of years.

In summary, one concept for limiting the introduction of Pact follow-on forces after the start of conflict is the early establishment of an interdiction belt on the eastern side of the interzonal border. A first phase, considered within hours of the original border crossings, would attack choke points on fixed LOCs through the belt to disrupt the enemy's scheme of maneuver. A second phase would continually attack enemy units piled up behind the choke points and attempting to transit the belt. The concept would permit NATO to concentrate a large portion of its surveillance, target acquisition, and strike assets in a relatively narrow geographical area rather than over a large area extending deep into the Federal Republic of Germany and Czechoslovakia. By replying to the initial Pact attack in an early, massive, concentrated, and continuing manner, NATO could seize the initiative in defensive operations in a way that is characteristically assumed to be Soviet doctrine for offensive operations. And with a number of improvements in NATO capabilities. it could offer an effective forward defense based on conventional weapons even in the face of a major Pact attack.

As with the barrier concept, this concept could be militarily feasible, although our analytic efforts have not examined all of the military aspects, including possible Pact countermeasures. But the concept also raises issues of cost and political feasibility. No detailed estimates of the dollar cost associated with developing NATO's capability to implement an interdiction belt were available. In general terms, there are no new surveillance, target acquisition, delivery platforms, or weapon systems required that are not already under consideration. Differences may exist in the extent to which NATO forces are equipped with some of the systems. For example, the Phase Two operations would require a sufficient portion of NATO's aircraft to be equipped with a night and all-weather capability to attack enemy units attempting to transit the belt under those conditions. Therefore, there are likely to be some incremental costs for providing such capability.

On the other hand, because the interdiction belt emphasizes a limited, in-close, geographical area, the numbers of surveillance, target acquisition, and weapons being considered for some types of "deep" interdiction operations may be reduced. In any event, it is highly unlikely that the incremental costs for obtaining the capabilities to implement the interdiction belt concept would involve anything approaching the multi-billion dollar cost of a major fixed fortified barrier.

As to the political issues associated with the interdiction belt, they fall into at least three areas. One area involves political issues associated with implementing a concept that involves all of the NATO countries with forces in the Central Region. Since the belt is likely to be effective only if implemented as a NATO-wide response, it requires agreement on both the specific concept and on the centralization required to do the planning, target selection, allocation of capabilities, etc., so that it can be carried out as a coordinated NATO response to a Pact attack.

A second area involves agreement on the timeliness of carrying out the Phase One operations. The interdiction belt concept calls for

virtually immediate implementation following clear evidence that a Pact attack is underway. Implementation, provided that the necessary target selection, weapon tasking, and associated planning has been carried out during peacetime, should take place within a matter of hours after the start of conflict. This will necessitate some pre-delegation of authority for timely implementation of the response and for the attack of LOC targets, as well as military forces in the German Democratic Republic and Czechoslovakia, conditions which have been continuously problematic for NATO.

A third area involves the relative precedence that is given to airpower. Since the concept depends heavily on attacking enemy units before they reach the interzonal border, airpower is the principal capability required. While this emphasis on the use of airpower well forward of NATO's ground forces should result in fewer losses to the ground forces because of the reduced strength of enemy units getting through the interdiction belt, it does not limit the importance of NATO's full ground force capability. The analytic work on the effectiveness of the interdiction belt in stopping Pact forces before they penetrated 50 kilometers was based on the assumption that NATO's current ground strength (and reinforcements) would not be changed. However, political issues could still be raised about over reliance on the use of airpower or on potential reductions in ground forces.

The interdiction belt concept, as is also the case with the fortified barrier case, is only one example of one approach to the topic of alternatives to NATO's current defense capabilities and to the analytic aspects of such concepts. A third approach and one illustrative concept for that approach are presented in the next section.

DISTRIBUTED AREA DEFENSE

A third approach to NATO defense is in some ways similar to NATO's current concept. NATO's current defense concept does not try to stop a Pact attack with heavy fortifications in the border area. It does not involve a massive interdiction effort to prevent those forces that may have already crossed the border from being reinforced by follow on

forces. Rather, it anticipates that, if deterrence fails, NATO will engage in direct defense in the forward area. If the conflict continues at the conventional level, NATO will conduct effective combat operations and stop the Pact. The combination of maneuver and attrition, the nature of the active defense, the form of air/land combat, as well as the possible extent of the Pact advance, the interrelations between conventional and nuclear operations, and the military/political aspects of the conflict and its termination have been subject to continual comment, argument, and discussion. An almost countless number of suggestions and proposals have been made on how to improve NATO's capability to execute its current concept. Among the more innovative of these has been the group that have put heavy emphasis on the use of small, highly equipped, anti-tank units operating over an extended area of the Federal Republic of Germany.

At least two major factors contribute to the interest in this solution. One is the increasing military effectiveness of technologies in precision delivery of munitions, new weapons platforms, command-control-communications, computers, electronic warfare, etc., as well as the promise of new capabilities in the advanced and emerging technology, robotics, and other areas. The second is the changing nature of the potential battleground, i.e., the Federal Republic. The FRG has been undergoing an urbanization, a channeling of traffic, a development of farm and forest areas, etc., that could significantly reduce the capability for the maneuver of large military forces. If they ever existed in this area, the days of continental maneuvering of modern armies are virtually gone.

With this growing recognition that enemy operations are more geographically restricted and the lethality and control of defense forces are increasing, the opportunity exists for defense concepts that put high premiums on small, well equipped, anti-tank units distributed throughout a substantial area of the Federal Republic, particularly the eastern portion.

Although the specific size, organization, equipping, and operational mode of such forces differ in their various proposals, American, British, Canadian, French, and German authors have described somewhat similar concepts using terms like distributed area defense teams, technological guerrillas, techno-commandos, etc.

The version of the approach outlined as the Distributed Area Defense concept in our effort consists of creating a very large force of small area defense units. The units would be of two basic types--direct fire units and indirect fire units. The direct fire units, numbering in the tens of thousands, and the indirect fire units, numbering in the thousands, would be distributed throughout the forward 50 to 100 kilometers of the Federal Republic. These units would be equipped with advanced anti-tank weapons, communications, air defense weapons, etc.

The major objectives of the area defense forces would be to gradually attrite enemy forces as they penetrated FRG territory. The direct fire units operating primarily in wooded areas and in the environs of urban areas would force the enemy to use main routes and roads. The indirect fire units operating from concealed positions would bring large volumes of fire to bear on enemy forces moving through the open areas. In the event of a conflict, all units would operate in pre-assigned areas. However, during peacetime, they would be in garrisons close to their assigned operating areas. Depending on the state of alert, different numbers would deploy from their peacetime locations. In essence, the number of units in the field provide a "variable" response to the level of crisis in NATO.

In the Distributed Area Defense concept, the thousands of small units would be drawn from existing NATO forces and the remainder of the NATO forces available (depending on the mobilization period) would support the area defense units as main defense forces behind the forward area.

The general characteristics of the concepts can be summarized as follows:

AREA DEFENSE UNITS

- o Direct-fire: tens of thousands
  - Equipment
    - o Man-portable anti-tank weapons
    - o Communications
    - o Personal weapons
  - Organization
    - o Assigned sectors for teams
    - o Company areas for support
    - o Battalion areas for administration
- o Indirect-fire: thousands
  - Equipment
    - o Self-contained, precision, indirect fire system
    - o Communications
    - o Air defense weapon
  - Organization
    - o One for four direct-fire units
- o Operations
  - Peacetime
    - o Normal garrison
    - o Some alert units
    - o Training in assigned areas
  - Transition
    - o Variable numbers deployed
  - Combat
    - o Deploy to assigned areas (trucks, IFVs helicopters, etc.)
    - o Set up ambush and defense on major attack axes
    - o Hit and run attacks
    - o Movement to "hides," stay behinds
    - o Support, maintenance; local; caches

MAIN DEFENSE FORCES

- o 12 to 40 divisions

The analysis of this concept, like that of the preceding concepts, used the MASTER model. However, because of the importance of terrain, intervisibility, timing of fire and movement, communications, etc., on any assessment of small unit operations, the MASTER model was supplemented by another analytic effort. This effort utilized a three-dimensional terrain board, several computer models, and a manual

gaming approach in which a 20 by 30 kilometer area of the interzonal border was represented and combat operations were simulated on a minute by minute basis.

The data and insights drawn from this detailed analysis were extended to the MASTER theater level assessment. Again, without going into all of the variations and details of the assessments, the general results indicated that small direct and indirect fire units, numbering in the tens of thousands and distributed throughout the forward area, could create such heavy casualties on the enemy forces that they would be unable to penetrate beyond 50 to 100 kilometers into the Federal Republic. Even this depth of penetration took place over an extended period of time and with heavy enemy losses.

In terms of the cost and political issues connected with the Distributed Area Defense concept, several points can be noted. If the area defense units are drawn from existing forces, they will require capabilities that are not widespread in current units. For example, very large numbers of direct fire weapons and new, self-contained indirect fire weapons systems. While these items will be additions to the defense budgets, they will reduce the requirement for the larger, more expensive weapon systems when the time comes to replace them in those forces that have been restructured into area defense units. On an extended time basis, it is possible that the concept would involve an actual reduction in defense budgets.

On the political side, the concept raises a number of issues. They range from broader issues of what forces of what nations would be reconfigured to create the area defense forces to such issues as changing garrison locations to conform to the forward disposition of area defense forces and the more rearward disposition of the divisions that constitute the supporting defense force. Related to these are many other issues involving new area command organizations and responsibilities, inter-relations with the civilian population and economy, the status of the FRG territorial forces, etc.

SUMMARY

This paper has covered a very broad area at a very general level. It has made a number of assertions and contentions in order to provide a perspective for considering the potential contributions of analysis. The thrust is that:

- o There are a number of different approaches to improving the defense capabilities of NATO
- o Within these different approaches, there are alternative defense concepts
  - Several possible concepts have been described
  - Some analysis of the effectivenee requirements of these concepts has been done
  - Some of the cost and political implications have been identified.
- o The concepts, the analysis, the issues that have been described should raise a host of questions

And, finally, the challenge of this presentation is to define the concepts and issues and the factors in them which the analytic community is capable of addressing in a coherent, credible, constructive, and contributing way.

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